

**Nutrient Management Plan  
for the  
Annandale Campus  
Northern Virginia Community College**

**Prepared for:**

**Northern Virginia Community College  
Facilities Planning Division, Rm. 314B  
8333 Little River Turnpike  
Annandale, VA 22003**

**Prepared By:**

**Paul W. Leeger/Certified Nutrient Management Planner - Certification No. 830**

**EEE Consulting, Inc.  
8525 Bell Creek Road  
Mechanicsville, VA 23116**

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Location Information	
Physical Address	8333 Little River Turnpike
City State Zip	Annandale, VA 22003
<a href="#">Coordinates</a>	+38 50' 3.30"
NAD 83 Deg Min Sec	- 77 14' 12.07"
<a href="#">VAHU6 Watershed Code</a>	PL30 – Accotink Creek
County	Fairfax

Square Footage of Management Areas	
Total	13.74 acres (598,575 ft <sup>2</sup> )
Area 1	13.74 acres (598,575 ft <sup>2</sup> )

Plan Start Date	July 15, 2018
Plan End Date	July 15, 2021

Planner Signature	
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## **1.0 INTRODUCTION AND SITE DESCRIPTION**

### **1.1 Introduction**

This Nutrient Management Plan (NMP) is for the Annandale Campus of the Northern Virginia Community College (NOVA) in the northwestern corner of Fairfax County, Virginia, just south of the Little River Turnpike and west of I-495 (Figure 1).

This NMP addresses only the nutrient management of turfgrass. Management of other vegetated areas containing trees, flowering ornamentals, small shrubs and groundcovers, is performed by each facility and their landscape contractor based on very site specific conditions including but not limited to the type and status of vegetated areas, annual soil testing, and the occurrence of pests and weeds. This NMP is effective for three years (until July 15, 2021) or until major renovation or other changes to maintenance practices occur. This NMP should be used as a resource for planning the quantity and timing of turfgrass nutrient application based on sound agronomic practices.

### **1.2 Site Description**

The 76-acre Annandale Campus contains turfgrass in many areas including around campus buildings, along roadways and around and within parking lots. The Annandale Campus contains one athletic field located at the northwestern end of the campus, adjacent to the campus lake. All turf areas have been seeded with a tall fescue blend (mix of fine leaved tall fescue and Kentucky bluegrass) and are therefore categorized as cool season turf.

In general, turfgrass is in good condition with the exception of some of the parking medians. These problem areas are generally located in the large parking lot located in the southern end of the campus and are discussed in Section 3.2.

Portions of the turfgrass areas are irrigated: along the front of Building CA, along portions of Parking Garage CP, and the front of CE. The remainder of the turf is non-irrigated.

Six environmentally sensitive areas including the campus lake and stormwater management facilities were identified on the Annandale Campus as shown on Figures 2 and 3. These areas are addressed in Section 4.

### **1.3 Current and Future Turf Maintenance**

All turf maintenance is performed by NOVA's landscaping contractor including mowing, herbicide, fertilizer and lime applications, as well as aeration and overseeding.

A landscaping maintenance contractor will be performing most turf management including all nutrient applications. It will be the responsibility of the Landscape Supervisor and the campus Facility Manager to ensure the nutrient management plan is followed.

## **2.0 SOIL SAMPLING AND ANALYSIS**

Although most soils in the turf areas have been modified by cut and fill activities, the soils retain most of the characteristics presented in the U.S. Department of Agriculture (USDA) soil survey, and may still be classified as loams, silty loams, and clay loams. Areas around the lake have steep slopes and thin soils.

Soil samples were collected on February 13, 2018 from four (4) different turfgrass areas across the campus and submitted for laboratory analysis including pH, buffer pH, phosphorus and potassium, and other soil properties. Figure 2 shows the locations of the soil sampling areas as well as environmental sensitive areas and Table 1 presents the laboratory results. Appendix A presents the soil laboratory data. An area previously under construction was added to this NMP. No sampling was performed within wooded or landscaped areas.

Soil laboratory results were converted into nutrient management ratings based on the Virginia Nutrient Management Standards and Criteria (VNMS&C). Soil phosphorous concentrations were each rated L-, and potassium concentrations ranged from a M to H rating. Soil pH ranged from 6.4 to 7.1 Standard Units (SU).

## **3.0 NUTRIENT MANAGEMENT AREAS**

Based on the soil test results, current turf conditions, the intensity of use, and overall visibility and aesthetic considerations, one Nutrient Management Area (NMA) at the Annandale Campus is established for this NMP. The number of nutrient management areas was kept to a minimum to facilitate effective management and still protect water quality and maintain healthy turf. Figure 3 shows the nutrient management areas. Table 2 presents the application schedule for the nutrient management areas, discussed in greater detail in Section 3.1 below.

NMA 1 includes all 13.74-acres of cool season fescue turf at the Annandale Campus including the athletic field. As discussed in Section 3.2, some areas within NMA 1 should be temporarily removed from active nutrient management until an effective groundcover/turfgrass can be established.

### **3.1 Nutrient and Liming Applications**

#### **3.1.1 Nitrogen, Phosphorous and Potassium**

Nitrogen, phosphorous (P<sub>2</sub>O<sub>5</sub>) and potassium (K<sub>2</sub>O) are the three macronutrients essential for healthy turf and, along with lime applications, are the central focus of the NMP. Phosphorous and potassium recommendations are based on the soil laboratory results. Nitrogen recommendations are based on the turfgrass needs, not soil test results, which vary based on the type of turfgrass (cool vs. warm season) and level of management (standard vs. intensive). Recommended rates and timing of all three macronutrients is based on the VNMS&C. This NMP uses the most restrictive application rate based on individual sample results where multiple sampling areas are part of the same NMA.

The acceptable window for nitrogen application for cool season fescue turf at the Annandale Campus is from February 27 until December 6. Although aggressive spring and summer nitrogen fertilization can result in lush, dark green foliage, this occurs at the expense of the turf's root system. Turf with an inadequate root system will then struggle in the summer heat and moisture conditions. Additionally, too much nitrogen in spring and summer for cool season turf can result in leaching or runoff to nearby waterbodies. For these reasons, only 0.5 pound of slow release nitrogen is recommended during May to June to provide a sustained growth response without a flush in shoot growth at the expense of the roots. The bulk of nitrogen should be applied in monthly increments from September through November.

As phosphorous and potassium are not as mobile as nitrogen and generally reside in soil for longer periods of time, the application timing of these two macronutrients is not as critical as nitrogen. Incremental applications of these nutrients from September to November are recommended.

#### **3.1.2 Lime and pH**

Soil acidity is critical to plants because it affects the availability of nutrients in the soil and potential leaching of nutrients from the soil. Cool season fescue prefers a soil pH that is slightly acidic, at a level of approximately 6.2 Standard Units (SU). Periodic lime applications are necessary for many Virginia soils to correct low pH, add buffering capacity, to provide secondary nutrients calcium and magnesium as well as some micronutrients. Liming rates are based on soil test pH and buffer indices. Based on the 2018 soil samples, no lime applications are recommended for the first year of this NMP (see Table 2).

Liming recommendations are for the first year following soil sampling only. The soil should be tested for soil pH and Buffer pH in the late fall to winter each year to determine if additional annual liming is necessary.

### **3.2 Problem Turfgrass Areas and Temporarily Inactive Nutrient Management Areas**

Problem areas remain in the parking medians within the large parking lot located in the southern end of the campus and the most eastern parking median located in Parking Lot C-1. These problem turf areas are the result of poor soil quality, over-compaction, active erosion, or shading and poor soil moisture conditions caused by nearby trees. These areas where there is ineffective groundcover should continue to be temporarily removed from active nutrient management until corrective measures can be applied to improve the turfgrass or groundcover conditions.

Corrective action options will vary by area but may include additional soil amendments (compost/topsoil), aeration or shallow tilling, and the use of mulch, turf mats and blankets. Alternative landscaping such as pavers, and other hardscape treatments may be the best alternative for some areas. If turfgrass is the desired vegetative cover, the soil should be retested for soil and buffer pH and adjusted accordingly with limestone as part of corrective action. Once turfgrass is re-established the areas may be included in Nutrient Management Area 1 for nutrient recommendations.

### **3.3 Selection of Fertilizers**

Specific fertilizers have not been selected as a part of this NMP to provide greater flexibility and cost savings. The landscape contractor has the option to select either commonly used fertilizer blends that they may already have in stock or are readily available, or they can use custom blends, a common practice in the commercial landscaping industry. Slow release nitrogen containing fertilizers are recommended. This NMP will require revision should the landscape contractor and the campus Facility Manager decide to use animal manures or Class B biosolids (not of exceptional quality).

Provided the maximum rate of nitrogen per application and the total annual rates of all three nutrients are not exceeded as detailed in Table 2, the landscape contractor may use their discretion with the exact ratio of nutrients applied per application.

### **3.4 Pre- and Post-Emergent Herbicides**

Weed control is a necessary requirement for healthy turf and has been implemented in the past at the Annandale Campus. In the previous NMP period, pre and post emergent herbicides containing nitrogen fertilizers were applied in spring and early summer months for the campus grounds. As presented in Section 3.1.1, only one application of slow release nitrogen is recommended in the late spring. Therefore, additional straight application of herbicides without nitrogen additives may be required. The Virginia Cooperative Extension (VCE) Publication 430-532 (<http://pubs.ext.vt.edu/430/430-532/430-532.pdf.pdf>) presents a more detailed discussion of pre and post emergent herbicides for cool season turf.

### **3.5 Precautions for Fertilizer Applications**

General precautions for fertilizer application include:

- Try to avoid applying fertilizers on steep slopes 48-hours prior to a rain event.
- Do not apply fertilizers to frozen or snow covered ground, nor should they ever be used as ice melt.
- Avoid/minimize application of fertilizers to impervious areas such as parking lots, roads, and sidewalks, and within 25 feet of environmentally sensitive areas and stormwater collection/management facilities.
- Remove any granular materials that land on impervious surfaces by sweeping and collecting, and either put the collected material back in the bag, or spread it onto the turf.

### **4.0 ENVIRONMENTALLY SENSITIVE AREAS AND RECOMMENDED BUFFERS**

Six environmentally sensitive areas including stormwater management facilities were identified on the Annandale Campus as shown on Figures 2 and 3:

- Two detention basins located between the large parking lot and Buildings CE and CM
- The Annandale Campus Lake located at the northern end of the campus
- A wet pond located south of parking garage CP at the western end of the campus
- A bio-retention facility (rain garden) located along the south side of Building CA at the eastern end of the campus
- A rock infiltration trench located on the northern side of Building CA
- A detention basin north of the CW building.
- Three rain gardens, two Filtreras and an underground manufactured stormwater detention facility associated with the Brault building.

A no-fertilizer/pesticide application buffer area of at least 25 feet and preferably 50 feet should be established around these sensitive areas. Where practicable, native vegetation may be an alternative to turf in the buffer areas. The lake contains virtually no vegetated buffer. It is recommended that a vegetated buffer be installed in these areas to improve water quality. Turf in and around the detention basins should be mowed at a greater height.

### **5.0 OTHER TURF MANAGEMENT CONSIDERATIONS**

Aeration - Extensive core cultivation/aeration in the late summer to early fall is recommended for the Annandale campus. Core aeration is very disruptive to surface smoothness, but it is the best way to relieve the physical effects of soil compaction and increase soil oxygen levels.



**Grass Seed Type** – VCE 2014-2015 - Virginia Turfgrass Variety Recommendations <https://www.sites.ext.vt.edu/newsletter-archive/turfgrass/index.html> - (most recent year) should be referenced when selecting seed mix for over-seeding. The type should be suitable to environmental conditions of the Northern Virginia Transition zone. A general recommendation for the Annandale Campus is 90% Tall Fescue possibly blended with 10% Kentucky Bluegrass for turf in primarily sunny locations. Fine fescue blends may be more appropriate for shadier turf areas.

**Iron** - Iron applications (particularly foliar applications) may periodically be used for enhanced greening as an alternative to nitrogen. These applications are most beneficial if applied in late spring through summer for cool season grasses and in late summer/fall applications for warm-season grasses. Since iron is a micronutrient, its application levels are very low. The color response is short-lived (typically two to three weeks) because the iron-induced color response in the leaves is removed by mowing.

**Management of Grass Clippings** - The recycling of grass clippings on turf should be encouraged as an effective means of recycling nitrogen, phosphorus, and potassium. Where aesthetics allow, all clippings from mowing events should be returned to the turf rather than discharging them onto sidewalks or streets. Clippings should not be blown onto impervious surfaces or surface waters, dumped down stormwater drains, or piled outside where rainwater will leach out the nutrients creating the potential for nutrient loss to the environment

**Spreader Equipment Calibration** - Spreader equipment calibration is critical to NMP implementation. The landscape contractor should supply equipment calibration records to the campus Facility Manager on a routine basis.

## **6.0 RECORDKEEPING**

Proper NMP implementation requires diligent record keeping of fertilizer, lime and herbicide applications, and turfgrass conditions. Important information to retain with the plan includes soil tests reports; spreader settings; calibration results, dates of fertilizer application and rates applied; seeding or renovation; and unusual stresses caused by disease, drought, and pests. This information will also provide the background needed for future plan revisions.

## **7.0 REFERENCES**

Nutrient Management Training and Certification Regulations 4VAC50-85 (effective date November 23, 2014)

Virginia Nutrient Management Standards and Criteria (Revised July 2014):  
<http://www.dcr.virginia.gov/documents/StandardsandCriteria.pdf>

Spring and Summer Lawn Management Considerations for Cool-Season Turfgrasses 430-532:  
[http://pubs.ext.vt.edu/430/430-532/430-532\\_pdf.pdf](http://pubs.ext.vt.edu/430/430-532/430-532_pdf.pdf)

Winter Management and Recovery Tips to Optimize Athletic Field Safety and Performance for Spring Sports, VCE Publication 430-408: ([http://pubs.ext.vt.edu/430/430-408/430-408\\_pdf.pdf](http://pubs.ext.vt.edu/430/430-408/430-408_pdf.pdf))

Virginia Cooperative Extension Publication 2014-2015 - Virginia Turfgrass Variety Recommendations [http://pubs.ext.vt.edu/CSES/CSES-17/CSES-17\\_pdf.pdf](http://pubs.ext.vt.edu/CSES/CSES-17/CSES-17_pdf.pdf)

## TABLES

**Table 1 - Soil Test Summary**

Site:		Annandale Campus – NOVA							
Testing Lab:		Waypoint Analytical (Formerly A&L Eastern Laboratories)							
Sample Date:		2/13/18							
Soil Sampling Area ID	Square Feet	Soil pH (SU)	Buffer pH (SU)	P (Mehlich I) ppm	P (H/M/L)	K (Mehlich I) ppm	K (H/M/L)	Soil description	Turf Species
AN-1	141,725	6.4	DNC*	0	L-	104	H-	Dark Brown, Sandy Clay Loam	Cool season, fescue
AN-2	250,982	6.7	DNC*	0	L-	108	H	Dark Brown, Sandy Clay Loam	Cool season, fescue
AN-3	151,455	7.1	DNC*	1	L-	87	M+	Dark Brown, Sandy Loam	Cool season, fescue
AN-4	54,413	6.8	DNC*	0	L-	52	M	Dark Brown, Sandy Loam	Cool season, fescue

Notes: SU = Standard Units; ppm = parts per million; P and K ratings are from Virginia Nutrient Management Standards & Criteria.

DNC\* = Buffer pH did not compute because the pH was above 6.2, according to Waypoint Analytical personnel.

**Table 2 – Nutrient Application Worksheet- Nutrient Management Area 1**Site: Annandale Campus – NOVABegins: 7/15/2018 Expires: 7/15/2021Nutrient Management Area: 1Square Feet: 598,575Landscape Plants: Cool Season Turf (Fescue)

Annual Nutrient Needs (lbs/1000 ft <sup>2</sup> ) <sup>1</sup>	Application Month/Day <sup>1,2</sup>	Amendment Material Notes	% Slow Release N	Total N	Total P205 (lbs/1000 ft <sup>2</sup> )	Total K20 (lbs/1000 ft <sup>2</sup> )	Lime Recommendation (lbs/1000 ft <sup>2</sup> ) <sup>3</sup>
<b>2.8-2*-0.75</b>	April 15-May 15	N – Fertilize & Lime	50% or greater	0.5	0	0	0
	Sept 1	Aerate, Overseed & Fertilize	50% or greater	0.9	0.75	0.25	
	Oct 1	Fertilize	50% or greater	0.9	0.75	0.25	
	Nov 1	Fertilize	50% or greater	0.5	0.5	0.25	
	<b>Totals:</b>			<b>2.8</b>	<b>2.0</b>	<b>0.75</b>	

**Notes:**

\*Up to 3 lbs of P2O5 per 1000 ft<sup>2</sup> is allowed per soil test results but only 2 lbs is recommended.

1. Fertilizer recommendations are flexible if the following conditions are met: a) no more than 0.7 pounds of Water Soluble N per 1000 ft<sup>2</sup> is applied within a 30-day period; b) no more than 0.9 pounds of Total N (per 1000 ft<sup>2</sup>) may be applied within a 30-day period; c) no more than 0.5 pounds of N per 1000 ft<sup>2</sup> is applied for the April 15-May 15 and the November applications; and d) Total annual fertilizer amounts for each nutrient should not exceed the Annual Nutrient Needs listed in column 1.

2. The month and day designations are a general guideline. Apply as close to the month as possible, using the day designation to determine the interval between applications.

3. Based on the soil sample laboratory results, no lime applications are needed for the first year of this NMP. Liming for successive years should be based on additional soil pH and buffer pH testing.

4. Do not apply inorganic fertilizers on frozen or snow-covered ground, or on denuded areas. Any fertilizer that makes its way onto impervious surfaces should be swept or blown back into pervious turfgrass – covered areas. Do not use fertilizers as ice melt.

5. Use a drop spreader for application of inorganic fertilizers on turf areas less than 10 feet wide or on slopes greater than 2%.

6. Apply pre and or post emergent herbicides as needed, but do not use fertilizer containing herbicide prior to April 15<sup>th</sup> and conditions must be met in Note 1.

## FIGURES

**Figure 1:     Annandale Campus–Project Location**

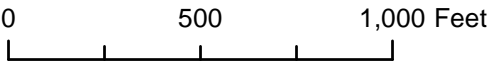




Date: July, 2018  
Author: KMM  
Source: 2013 VBMP Imagery.  
Projection: NAD 1983 StatePlane Virginia North FIPS 4501 Feet



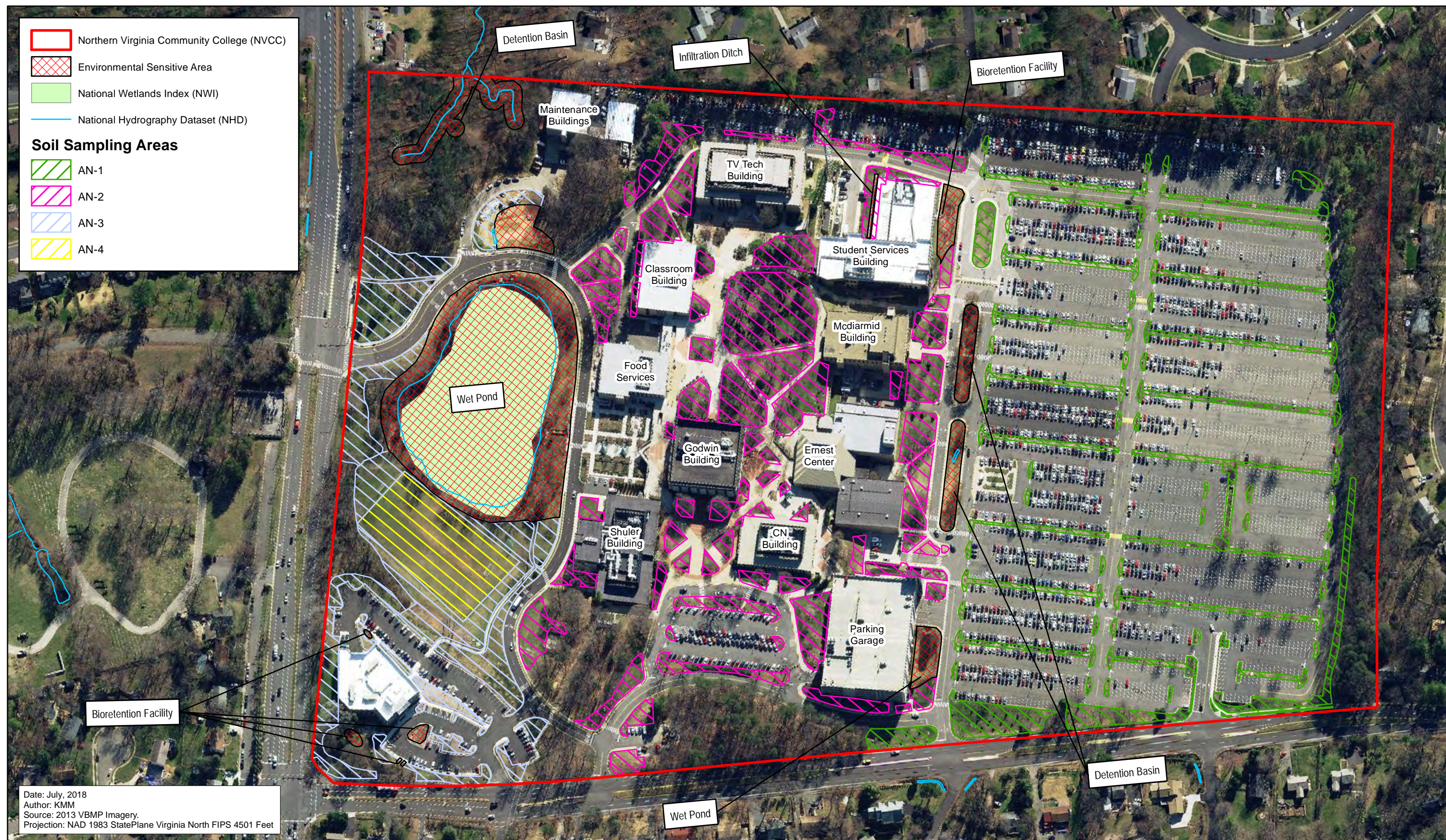
**Figure 1: Annandale Campus**  
**Project Location**  
NVCC NMP





**Figure 2: Annandale Campus-Soil Sampling Areas**



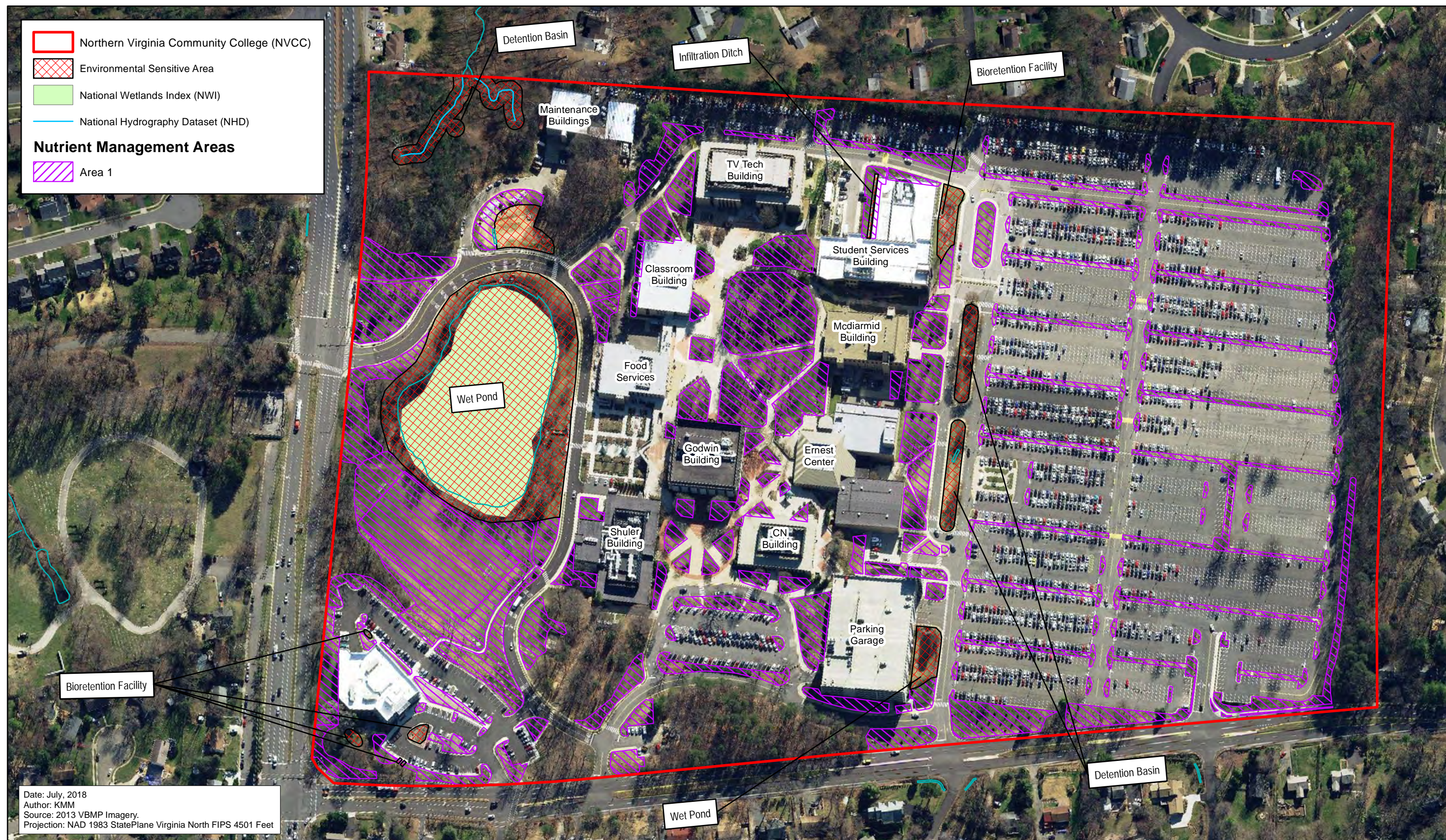


**Figure 2: Annandale Campus  
Soil Sampling Areas  
NVCC NMP**

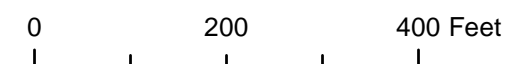


**Figure 3:     Annandale Campus-Nutrient Management Areas**





**Figure 3: Annandale Campus  
Nutrient Management Areas  
NVCC NMP**





## **APPENDICES**

## **Appendix A**

### **Laboratory Soil Test Results**

Report Number: 18-046-0753

Account Number: 78934

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7621 Whitepine Road, Richmond, VA 23237  
Main 804-743-9401 ° Fax 804-271-6446  
www.waypointanalytical.com

Send To: EEE Consulting Inc  
201 Church Street  
Suite C  
Blacksburg VA 24060

Grower: NVCC-Annandale  
8333 Little River Turnpike

**SOIL ANALYSIS REPORT**

Analytical Method(s): SMP Buffer pH Mehlich 3 Loss On Ignition Water pH

Date Received: 02/15/2018

Date Of Analysis: 02/16/2018

Date Of Report: 02/16/2018

Sample ID Field ID	Lab Number	OM	W/V	ENR	Phosphorus			Potassium	Magnesium	Calcium	Sodium	pH		Acidity	C.E.C
		% Rate	Soil Class	lbs/A	M3 ppm Rate	ppm	Rate	K ppm Rate	Mg ppm Rate	Ca ppm Rate	Na ppm Rate	Soil pH	Buffer Index	H meq/100g	meq/100g
An-1	07535	4.4 M		130	6 VL			147 H	142 H	754 M		6.4		0.5	5.8
AN-2	07536	5.4 H		148	8 VL			152 VH	181 H	944 M		6.7		0.3	6.9
AN-3	07537	3.7 M		114	10 VL			122 M	160 H	1023 H		7.1		0.0	6.8
AN-4	07538	3.7 M		116	5 VL			73 L	136 H	810 H		6.8		0.2	5.6
Sample ID Field ID	Percent Base Saturation					Nitrate	Sulfur	Zinc	Manganese	Iron	Copper	Boron	Soluble Salts		
	K %	Mg %	Ca %	Na %	H %	NO <sub>3</sub> N ppm Rate	S ppm Rate	Zn ppm Rate	Mn ppm Rate	Fe ppm Rate	Cu ppm Rate	B ppm Rate	SS ms/cm Rate		
An-1	6.5	20.4	65.0		8.6										
AN-2	5.6	21.9	68.4		4.3										
AN-3	4.6	19.6	75.2		0.0										
AN-4	3.3	20.2	72.3		3.6										

Values on this report represent the plant available nutrients in the soil. Rating after each value: VL (Very Low), L (Low), M (Medium), H (High), VH (Very High). ENR - Estimated Nitrogen Release. C.E.C. - Cation Exchange Capacity.

Explanation of symbols: % (percent), ppm (parts per million), lbs/A (pounds per acre), ms/cm (milli-mhos per centimeter), meq/100g (milli-equivalent per 100 grams). Conversions: ppm x 2 = lbs/A, Soluble Salts ms/cm x 640 = ppm.

This report applies to sample(s) tested. Samples are retained a maximum of thirty days after testing.

Analysis prepared by: Waypoint Analytical Virginia, Inc.

by: *Paucic McGeary*

Paucic McGeary

Report Number: 18-046-0753

Account Number: 78934

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Send To: EEE Consulting Inc  
201 Church Street  
Suite C  
Blacksburg VA 24060

Grower: NVCC-Annandale  
8333 Little River Turnpike

Date Received: 02/15/2018

Date Of Report: 02/16/2018

**SOIL FERTILITY RECOMMENDATIONS**

Sample ID Field ID	Intended Crop	Yield Goal	Lime Tons/A	Nitrogen N lb/A	Phosphate P <sub>2</sub> O <sub>5</sub> lb/A	Potash K <sub>2</sub> O lb/A	Magnesium Mg lb/A	Sulfur S lb/A	Zinc Zn lb/A	Manganese Mn lb/A	Iron Fe lb/A	Copper Cu lb/A	Boron B lb/A
An-1	Lawn	0	0.0	3.5	4.0	0	0						
AN-2	Lawn	0	0.0	3.5	4.0	0	0						
AN-3	Lawn	0	0.0	3.5	3.5	1.0	0						
AN-4	Lawn	0	0.0	3.5	4.0	1.0	0						

**Comments:****Sample(s) : AN-2,AN-3,AN-4 Crop: Lawn**

For a more in depth explanation of the soil test and recommendations, go to our website [www.aleastern.com](http://www.aleastern.com) and select the "Lawn and Garden" tab at the top of home page. Under the "How to Understand a Soil Test Report" header you will find the link to the article "Soil Test Report & Fertilizer Recommendation Explained".

The amount of fertilizer recommended on the first page is the total amount needed for the entire growing season. Split into 3-4 applications to keep the lawn green and prevent fertilizer loss. You should not apply more than 0.7 lbs of soluble nitrogen per 1000 square feet in a 30 day period. Or more than 0.9 lbs of nitrogen per 1000 square feet if you are using a slow or controlled release product in a 30 day period. Custom blend is best to meet exactly the requirement, if this is impossible, the above specific fertilizer application is a general guideline, if the specified grades can not be found, replace with fertilizer having similar N:P:K ratio. The best time to apply fertilizer for cool season grass (bluegrass, fescue, ryegrass) is in the Fall when the grass is growing. For Mid-Atlantic region the time is from late August to November. For Northeast region the time is from mid August to October. Fall application should start as soon as the day time high temperature is below 80-85F, apply with the interval of one month. If you start application late in the Fall and do not finish all three applications, repeat the same applications in the Fall of next year. Spring application is recommended when exceptional fertilizer loss due to heavy spring rain leaching and the grasses look pale green. Spring application can start as soon as the grass starts to grow in April. In the case of exceptional warm spring, the application can be made earlier.

**Sample(s) : AN-3 Crop: Lawn**

Use ammonium sulfate as all or portion of the N requirement to reduce pH.

"The recommendations are based on research data and experience, but NO GUARANTEE or WARRANTY expressed or implied, concerning crop performance is made."

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Paucic McGroary